

AMENDMENT UNDER 37 C.F.R. § 1.111
U. S. Application No. 09/779,586

REMARKS

Claims 1-9 and 11-13 are all the claims pending in the application, since claim 10 is cancelled by the present Amendment.

Claims 1-9, 12, and 13 stand rejected under 35 U.S.C. § 102(b) as being anticipated by previously-cited Jayaraman (US 5,513,204). Claims 8, 10, and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Jayaraman. Applicant respectfully traverses the rejections as set forth below.

Independent claims 1 and 12 are amended herein to recite that the second mirror is physically separate from the surface-emitting semiconductor element, as previously described in prior pending claim 10. Accordingly, claim 10 is cancelled. Applicant submits that Jayaraman fails to teach or suggest this feature of the claims. Instead, Jayaraman discloses a second mirror 37 that is not physically separate from the surface-emitting semiconductor element 40. See FIG. 3, for example. Moreover, the Examiner admits that the reference does not disclose the features of prior pending claims 10 and 11. See page 4 of the Office Action, where the Examiner asserts that the teachings of claims 10 and 11 would have been an obvious modification to Jayaraman, thereby indicating that Jayaraman does not already disclose these features. Thus, Jayaraman does not anticipate the proposed amended claims.

Due to the cancellation of claim 10, claim 11 is amended to make it depend from claim 1.

Furthermore, Applicant submits that the second mirror being physically separate from the surface-emitting semiconductor element would not have been an obvious modification to Jayaraman. The Jayaraman reference is directed to wafer-scale technology, in which a pair of VCSELs 40/43 are arranged together, wherein the second VCSEL 40 includes second mirrors

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37. By contrast, claims 1 and 12 of the present invention claim a second mirror that is physically separate from the surface-emitting semiconductor element. Applicant submits that modifying Jayaraman to physically separate the mirrors 37 from the surface-emitting semiconductor element 40 would not have been obvious to one of ordinary skill in the art, because such a modification would be a fundamental change to the structure of Jayaraman's surface emitting laser. This appears to be the case, because all of the embodiments disclosed in the reference have the second mirror as part of the second surface emitting laser. Furthermore, separating the second mirrors 37 from the second VCSEL 40 would change the operation of the VCSEL 40 as intended by Jayaraman, which is intended to have the mirrors 37 included as part of the VCSEL 40.

The Examiner cites Nerwin v. Erlichman to support the obviousness rejection. However, this case is distinguishable, because the Examiner has incorrectly characterized the holding in Nerwin. Namely, in Nerwin, the Board was concerned with a count construction in an interference proceeding, which is not at all relevant to the Examiner's burden of showing a *prima facie* case of obviousness. Further, the Board merely held that the fact that a given structure is integral (as shown in a figure of the disclosure) does not preclude it from consisting of various elements in a count. That is, a structure may be set forth in a count as having a *first* sub-element and a *second* sub-element, even if the structure is depicted in the disclosure as an integral body. This concept is practically and conceptually different from an obviousness rejection in which an integral structure (in the prior art) is modified to be constructed from various elements that are separate from each other. Consequently, the Examiner's heavy reliance upon Nerwin is misplaced.

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Therefore, Nerwin has little, if any relevance, to the present case. Furthermore, it is well-settled that separability of components may only be obvious by showing a sufficient motivation for the separability. In re Dulberg, 129 USPQ 348, 349 (CCPA 1961). Here, the Examiner provides no reason for separation of the resonating mirror from the semiconductor laser element. In fact, for the reasons discussed above, the separability would not be desirable due to the integral nature of VCSELs. Moreover, the physical separation would require a physical restructuring of element 37 and intervening structures that are not contemplated by the reference. Therefore, the obviousness position is not supported, and claims 1 and 12 are patentable.

With further regard to dependent claim 8, the Examiner cites In re Rose. Applicant submits that Rose is distinguishable, because the difference in size between the prior art and claims 8 is more than simply a change in scale. In this case, the structure claimed in claim 8 has a size which is 0.1 to 10 times as large as a diameter to which the second laser light spreads at a position of the structure for controlling the spatial mode of the second laser light. In other words, the size of the structure is related to the diameter of the laser light at a position of the structure, not simply a size value unrelated to operation of the apparatus.

Here, the size adjustment permits an improved control over the spatial mode, which was not recognized by the cited art. Moreover, the shape/size adjustment described in claim 8 is patentable without some teaching in the prior art. Ex parte Garlach, 212 USPQ 471 (BPAI 1980).

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

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Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claim 10 is canceled.

The claims are amended as follows:

1. (Amended) A laser apparatus comprising:

a semiconductor laser element which emits first laser light having a first wavelength;

a surface-emitting semiconductor element which is excited with said first laser light,

emits second laser light having a second wavelength which is longer than said first wavelength,

and has an active layer and a first mirror arranged on one side of said active layer;

a second mirror which is arranged outside said surface-emitting semiconductor element
so that said first and second mirrors form a resonator in which said second laser light resonates;
and

a modulation unit which modulates said surface-emitting semiconductor element[.];

wherein said second mirror is physically separated from said surface-emitting

semiconductor element by an air gap.

11. (Amended) The laser apparatus according to claim [10]1, wherein said first laser
light enters said surface-emitting semiconductor element through said air gap.

12. (Amended) A laser apparatus comprising:

a semiconductor laser element which emits first laser light having a first wavelength;

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a surface-emitting semiconductor element which is excited with said first laser light, emits second laser light, and has an active layer and a first mirror arranged on one side of said active layer;

a second mirror which is arranged outside said surface-emitting semiconductor element so that said first and second mirrors form a resonator in which said second laser light resonates; and

a modulation unit which modulates said surface-emitting semiconductor element; wherein said surface-emitting semiconductor element has a pn junction, and said modulation unit modulates the surface-emitting semiconductor element by varying a voltage applied to the pn junction[.];

wherein said second mirror is physically separated from said surface-emitting semiconductor element by an air gap.